



ENVIRODYNE ENGINEERS

12761 Leckland Road,
St. Louis, Missouri 63141
(314) 454-6960

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4/6/83

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April 6, 1983

Mr. Harold Baker
Baker and Schrivner
56 South 65th Street
Belleville, Illinois 62223

Dear Mr. Baker:

Envirodyne Engineers, Inc. (EEI) is pleased to submit the results of the analyses of soil samples for 2,3,7,8-TCDD and PCB's. The samples collected on February 19, 1983 were analyzed for 2,3,7,8-TCDD and total PCB's and the samples collected on March 12, 1983 were only analyzed for 2,3,7,8-TCDD. The field notes made during sample collection are appended to this report.

Sample Preparation and Analysis

- A. 2,3,7,8-TCDD: The soil samples were prepared and analyzed for 2,3,7,8-TCDD using the procedure described in the February 1983 revision of "USEPA, Region VII Method for Determination of 2,3,7,8-TCDD in Soil and Sediment". All quality assurance procedures described in that method were used. The internal standard was ^{13}C -2,3,7,8-TCDD and cleanup Option A described in the method was used. All analyses were by low resolution GC/MS using a 30m DB-5 fused silica capillary column.
- B. PCB: The soils extracted in a soxhlet apparatus and analyzed by GC/EC Standards of Arochlor 1242, 1254 and 1260 were used to calculate PCB concentrations in the samples. One sample (EEI No. 44692) was analyzed in duplicate and a blind EPA performance sample was also analyzed as a check on method performance.

Results/Decision

The analytical data for these samples are summarized in Tables 1-3. Tables 1 and 2 summarize the data for the analysis of 2,3,7,8-TCDD and PCBs in the samples collected on February 19, 1983, and Table 3 summarizes the 2,3,7,8-TCDD data for analysis of samples collected on March 12, 1983. There are several samples from both sets which contain concentrations of 2,3,7,8-TCDD ranging from 5.1 ng/g to 170 ng/g.

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The recovery of the internal standard for sample 44696 is below the recommended minimum (25%) for the method. We have no obvious explanation except that all internal standard recoveries for the samples collected on February 19, 1983 were lower than expected. The estimated analytical detection limits for 2,3,7,8-TCDD in several samples collected on March 12, 1983 are higher (most notably Samples 45000-45003) than the 1 ng/g (1 ppb) detection limit required by the Region VII Method. The reason for this is the presence of compounds (probably PCBs) which interfere with accurate analysis of 2,3,7,8-TCDD. In one sample (Sample No. 44997) the concentration of interferences is so high that no reliable estimate of the concentration of detection limit could be made for this sample, although inspection of the chromatogram and data for other samples obtained from this location indicates that there is a high probability that this sample contains 2,3,7,8-TCDD.

The samples from Sample Location 9 all have high detection limits due to the presence of interferences. These samples should be reanalyzed using alternative cleanup procedures.

The data for the PCB analyses of the samples collected on February 19, 1983 are summarized in Table 2. Measurable concentrations of PCB's were found in all samples collected on February 19, 1983 and ranged in concentration from 28 ng/g in Sample 44691 to 149,600 ng/g in Sample 44693. Also, included in this table is a list of the probable PCB mixtures contained in each of these samples.

Conclusions and Recommendations

1. Substantial number of samples contain 2,3,7,8-TCDD in excess of 1 ng/g with a maximum observed concentration of 170 ng/g. The CDC has proposed a limit of 1 ng/g as maximum level of 2,3,7,8-TCDD in soils for protection of human health. In addition, EPA has announced their intention to classify chlorinated dioxins as an "Acutely Hazardous" substance which will significantly restrict disposal options (Federal Register, March 17, 1983).

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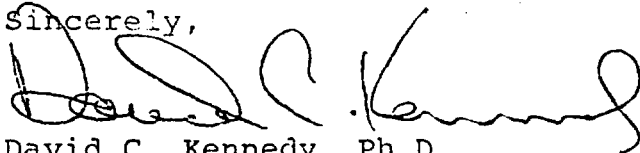
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2. Substantial number of samples contain high levels of PCB's. In particular, three samples contain PCB's in excess of 50 parts per million (50,000 ng/g) which will restrict disposal options.
3. Samples from Sample Location 9 should be reanalyzed using alternative cleanup procedures to determine at a lower detection level, the presence or absence of TCDD.
4. The samples collected on March 12, 1983 should be analyzed for PCB's.
5. The analytical results obtained to date should be transferred to a base map of the site and concentration isopleths developed to guide further investigation and remedial measures.
6. It is likely that disposal or on-site containment of contaminated soil will be required. In this event, additional depth-discrete sampling and analysis for TCDD and PCB's will be required to determine quantities of soils to be handled and suitable disposal or containment methods. This activity, if required, should be carefully planned and executed.

If you have any questions regarding this information, please feel free to contact me.

Sincerely,



David C. Kennedy, Ph.D.
Vice President/Office Manager

EMH/nja
Attachments

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TABLE 1
ANALYTICAL DATA SUMMARY
FOR ANALYSIS OF SOIL SAMPLES
FOR 2,3,7,8-TCDD

<u>Sample</u>	<u>Desc</u>	<u>Date Collected</u>	<u>EEI Sample No.</u>	<u>TCDD (ng/g)</u>	<u>Percent Recovery</u>
1	0-7"	2/19/83	44687	<0.46	25
2A	0-7"	2/19/83	44688	<0.74	24
2B	7"-13"	2/19/83	44689	<0.32	26
3A	0-7"	2/19/83	44690	<0.16	28
3B	7"-13"	2/19/83	44691	<0.46	27
4A	0-6"	2/19/83	44692	<0.21	50
4B	6"-13"	2/19/83	44693	<0.38	44
5A	0-6"	2/19/83	44694	28	43
5B	6"-14"	2/19/83	44695	5.1	41
6	0-8"	2/19/83	44696	<0.56	18
6 (duplicate)	0-8"	2/19/83	44696D	<0.41	26

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TABLE 2
ANALYTICAL DATA SUMMARY
FOR PCB ANALYSIS OF COIL SAMPLES

<u>Sample</u>	<u>Desc.</u>	<u>Date Collected</u>	<u>EEI Sample No.</u>	<u>PCB (ng/g)</u>	<u>Comments</u>
1	0-7"	2/19/83	44687	3,690	Arochlor 1242, 1254
2A	0-7"	2/19/83	44688	5,350	Arochlor 1242, 1260
2B	7"-13"	2/19/83	44689	716	Arochlor 1242
3A	0-7"	2/19/83	44690	137,250	Arochlor 1242, 1260
3B	7"-13"	2/19/83	44691	28	Arochlor 1242, 1260
4A	0-6"	2/19/83	44692	21,020	Arochlor 1242, 1254
4A (duplicate)	0"-6"	2/19/83	44692D	15,510	Arochlor 1242, 1254
4B	6"-13"	2/19/83	44693	149,600	Arochlor 1242, 1260
5A	0-6"	2/19/83	44694	112,930	Arochlor 1242, 1260
5B	6"-14"	2/19/83	44695	12,050	Arochlor 1242, 1260
6	9-8"	2/19/83	44696	90	Arochlor 1254

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TABLE 3
ANALYTICAL DATA SUMMARY
FOR ANALYSIS OF SOIL SAMPLES
FOR 2,3,7,8-TCDD

<u>Sample No.</u>	<u>Date Collected</u>	<u>EEI Sample No.</u>	<u>Desc.</u>	<u>TCDD (µg/Kg)</u>	<u>Percent Recovery</u>
7A	3/12/83	44994	0-6"	<0.43	84
7B	3/12/83	44995	8-16"	<0.45	100
8A	3/12/83	44996	0-6"	44	82
8B	3/12/83	44997	6-12"	Interferences	219
8C	3/12/83	44998	13"-18"	19	100
8D	3/12/83	44999	18-25"	37 ,56 ✓	95 ,85
9A	3/12/83	45000	0-6"	<53 ✓	7
9B	3/12/83	45001	6-12"	<45	110
9C	3/12/93	45002	14-21"	<3.9	98
9D	3/12/83	45003	22-28"	<11	75
10A	3/12/83	45004	0-6"	<0.13	65
10B	3/12/83	45005	6-12"	13	74
11A	3/12/83	45006	0-6"	<10	78
11B	3/12/83	45007	6-18"	<4.6	80
12	3/12/83	45008	10-14"	<0.39	87
13A	3/12/83	45009	0-7"	<1.5	58
13B	3/12/83	45010	7-18"	<0.5	76
14	3/12/83	45011	0-6"	<0.86	76
15	3/12/83	45012	0-16"	13	72
16	3/12/83	45013	0-18"	170	84

3/12/83

<u>SAMPLE #</u>	<u>DESCRIPTION</u>	
7A	60' west of power pole, in line with N. end of Admin. Bldg. 0 to 6" gravelly sand	EPA/ENVIR
7B	8 to 13" Sandy gravel 13 to 16" Grayish Brown loamy sand	EPA/ENVIR.
8A	40' East of S.W. corner stake for Effluent pump station - In line with S. end of locker Bldg. 13' North of Southeast corner post 0 to 6" grayish brown sand loam	ENVIR.
8B	6" to 12" Loamy sand - grayish brown - Wood debris	EPA/ENVIR.
8C	13" - 16" as above - loamy sand, grayish brown 16" - 18" Yellowish brown - fine sand	ENVIR.
8D	18" - 25" yellowish brown - fine sand	EPA/ENVIR
9A	3 ft. S.W. of N.E. corner stake post 0" - 5" Brownish grey - sandy loam 5" - 6" Loamy sand - greyish brown	EPA/ENVIR
9B	6" - 12" Greyish brown - loamy sand with hunk of silty clay artifact	ENVIR.
9C	14" - 21" intermixed color - loamy sand to medium sand	EPA/ENVIR.
9D	22" - 28" very dark greyish brown loamy sand, last 2" intermixed with light yellowish brown medium sand	ENVIR.
10A (CS#2)	Control Sample	
10B (CS#2A)	Control Sample	
11	4 ft. N. W. of Line A Marker 20 +42.35 on line with marker 0+15 line B	
11A	0 - 5" brownish grey loam 5 - 6" yellowish brown medium sand	ENVIR.
11B	6" - 7" yellowish brown medium sand 7" - 18" dark brownish grey loamy sand, some gravel with cinders and glass debris	EPA/ENVIR.
12	10 ft. N. W. of N. W. corner of Effluent Pump Station	
12A	10" - 19" yellowish brown - fine sand	ENVIR.
13	3 ft N. W. of stake 0 + 15 Line B	
13A	0 - 6" light grey gravelly sand 6 - 7" Very dark greyish brown loamy sand	ENVIR.

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- 13B 7 - 18" Very dark greyish brown loamy sand, some slag EPA/ENVIR.
 present.
- 14 Random pile sample from West and North fence area (8 locations) ENVIR.
 Generally 0 - 6"
 Textures vary from sand, loamy sand, and sandy loam
- 15 South central area with water standing - inside S. boundary of
 pump station.
 0 - 8" varies from sand to loamy sand
 Various locations
 0 - 14" greyish medium sand - sedimentation EPA/ENVIR.
 14 - 16" very dark brown loam with debris
- 16 North central area with water standing EPA/ENVIR.
 0 - 18" - texture varies from loamy sand to sandy loam
 0 - 10" - silty clay loam to loam
 0 - 6" - loam
 Seven cores in total

PRESENT: John Zelle - American Bottoms
 Rick Snarski - Envirodyne Sampler
 Ken Mensing - I.E.P.A.
 C. J. Marciante - Sauget Wastewater Treatment Plant

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